UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

0000025

NOV 6 2001

REPLY TO THE ATTENTION OF

SE-5J

VIA FACSIMILE (312) 642-2773 & (847) 279-2510 AND U.S. MAIL

Mr. Sean Linnane
Magellan Development Group
1 West Superior, Suite 200
Chicago, Illinois 60610

Mr. Richard Berggreen
STS Consultants, Ltd.
750 Corporate Woods Parkway
Vernon Hills, Illinois, 60061

RE: Lakeshore East

Dear Messrs. Linnane and Berggreen:

Enclosed is a copy of a detailed review by Mr. Larry Jensen, Senior Health Physicist. Please revise your report accordingly. Since a number of the U.S. EPA staff assigned to this site will be unavailable, please send a revised report by November 28, 2001. In the interim, please deliver all samples to Argonne National Laboratory, 9700 Cass Avenue, Argonne, Illinois, 60439. Our Argonne contact is Ms. Alice Birmingham, Analytical Services, at (630) 252-8617.

If you would like to discuss this matter further, please contact me at (312) 886-3601, or Fred Micke, On-Scene Coordinator, at (312) 886-5123 or Larry Jensen, Senior Health Physicist, at (312) 886-5026. Please direct any legal questions to Mary Fulghum, Associate Regional Counsel, at (312) 886-4683 or Padma Klejwa, Associate Regional Counsel, at (312) 353-8917.

Sincerely,

Verneta Simon

Verneta Simon
On-Scene Coordinator

Enclosure

cc: Naren Prasad, City of Chicago - Department of Environment, w/enclosure
Benet Haller, City of Chicago - Department of Planning and Development, w/enclosure

U.S. ENVIRONMENTAL PROTECTION AGENCY
SUPERFUND DIVISION
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

DATE: October 29, 2001

SUBJECT: Review, "Radiation Survey, 26-Acre Site, Southwest Corner of Wacker Drive and Lake ShoreDrive, Chicago, Illinois," September 19, 2001

FROM: Larry Jensen, CHP
Regional Radiation Expert
Emergency Response Section #3

TO: Verneta Simon
On-Scene Coordinator
Emergency Response Section #3

Fred Micke
On-Scene Coordinator
Emergency Response Section #3

I have reviewed the above document and have the following comments.

GENERAL COMMENTS

1. The surface count rates and the surface soil concentrations do not correspond well.

2. Overall, soil concentrations are very low when compared to the several very high surface count rates.

3. One anomaly found in the USEPA survey was not relocated, nor confirmed, in this survey.

4. Results of the expanded survey are summarized but not given in detail with maps and grid readings as in the original, September 19, 2001, report.

SPECIFIC COMMENTS

1. **Page 5, para. 5**–The text does not specify what the general background count rate was. This is needed to understand what count rate was considered to be

"elevated" for the purposes of selecting drilling sites.

2. **Page 6, para. 2**–The text does not describe "continuously sampled" so that it is unclear in the text how a soil sample was collected. Observations during the drilling were that material was scraped from the dirt collected within the auger helix. If so, it is unclear if the material from a given depth came from that depth or was moved and/or compacted by the auger. This may explain why soil concentrations were low and why there was not a good correspondence between surface count rate and surface soil concentration.

3. **Page 8, para. 3**–The issue raised in the preceding question may apply here as well.

4. **Page 8, para. 4**–Contrary to the text, the highest gamma readings did not correlate with the highest analytical results.

This is shown in the following table based upon results, for the top one foot, taken from appendices of this document. To specify a Surface Count Rate for this table, either data was taken as (1) the count rate for that location (e.g., MM 66), or (2) if the count rate was given at location F.5, the higher count rate of F and G was used, or (3) if the count rate was given at location 50.5, the higher count rate of 50 and 51 was used, or (4) if the count rate was given at location F.5-51.5, the higher count rate among F-51, F-52, G-51 and G-52 was used.

SORTED BY DEPTH AND SURFACE COUNT RATE

LOCATION		SAMPLE DEPTH	TOTAL RADIUM (pCi/g)	SURFACE COUNT RATE (cpm)
F	50.5	1	2.95	626000
F 5	51.5	1	2.48	626000
G.5	50.5	1	101.80	278000
G.5	51.5	1	102.20	278000
PP.5	66.5	1	1.12	244000
MM	66	1	14.02	180000
MM	66.25	1	8.51	180000
NN.5	51	1	1.36	73000
OO.5	51	1	4.07	73000
OO.5	51.5	1	2.47	73000
SS	50.5	1	0.41	63500
SS.5	51.5	1	0.67	63500
D.75	52.75	1	1.54	43000
LL	59	1	1.31	32800
C.5	52.5	1	1.25	30000
F.5	52	1	2.12	25000
OO.5	52.5	1	1.69	24000

J	51.5	1	1.37	11300
PP.5	62.5	1	1.10	11000
PP.5	51	1	1.22	10100
OO.5	67	1	0.78	8600
PP.5	59	1	1.72	7000
SS.5	58.25	1	0.66	5900

It can be seen that, at the highest count rate (626,000 counts per minute, cpm), the total radium concentration is about 3 picocuries per gram (pCi/g) while, at half this count rate (278,000 cpm), the concentration is about 35 times higher (102 pCi/g). Also, at 63,500 cpm (a clearly elevated count rate) the total radium concentration is 0.41 - 0.67 pCi/g while at about 1/10 th this count rate (5900 cpm) the soil concentration is about the same (0.66 pCi/g). The correlations are not consistent.

5. **Page 9**–Contrary to the text, the thorium to uranium ratios are not consistently 4 to 1. Grand Pier data shows a wide range. The following ratios show this:

GRAND PIER
NUTRANL RESULTS
GREATER THAN 5 pCi/g
TOTAL RADIUM

Th-232	Ra-226	Ratio, Th-232/ Ra-226
1625.7	77.24	21.0
62.2	6.4	9.7
111.73	12.13	9.2
5023.8	574.94	8.7
26.73	3.97	6.7
29.38	4.88	6.0
21.64	3.64	5.9
849.41	163.58	5.2
335.02	65.65	5.1
69.08	14.31	4.8
5.52	1.15	4.8
295.61	62.02	4.8
293.69	61.8	4.8
1164.2	246.56	4.7
18.3	3.88	4.7
499.1	106.35	4.7

69.83	14.91	4.7
165.32	37.1	4.5
220.43	50.38	4.4
26.82	6.35	4.2
29.53	7.06	4.2
10.96	2.73	4.0
4180.7	1048.5	4.0

GRAND PIER
NUTRANL RESULTS
GREATER THAN 5 pCi/g
TOTAL RADIUM

Th-232	Ra-226	Ratio, Th-232/ Ra-226
6.66	1.7	3.9
250.11	64.37	3.9
34.53	8.92	3.9
56.65	14.64	3.9
15.71	4.13	3.8
11.66	3.11	3.7
77.49	21.07	3.7
5.5	1.5	3.7
630.67	174.02	3.6
6.36	1.76	3.6
28.53	7.91	3.6
5.84	1.67	3.5
71.42	20.49	3.5
21.07	6.05	3.5
15.98	4.63	3.5
203.36	60.52	3.4
14.77	4.51	3.3
30.06	9.2	3.3
23.38	7.32	3.2
57.86	19.02	3.0
11.48	3.82	3.0
15.87	5.31	3.0
5.39	1.87	2.9
9.26	3.22	2.9

36.8	12.9	2.9
13.14	4.65	2.8
9.92	3.54	2.8
56.99	20.69	2.8
371.11	135.3	2.7
28.92	10.59	2.7
304	113.86	2.7
6.78	2.54	2.7
10.73	4.05	2.6
36.03	13.68	2.6

GRAND PIER
NUTRANL RESULTS
GREATER THAN 5 pCi/g
TOTAL RADIUM

Th-232	Ra-226	Ratio, Th-232/ Ra-226
6.22	2.39	2.6
45.92	17.76	2.6
131.88	51.72	2.5
34.44	13.52	2.5
8.44	3.33	2.5
9.16	3.66	2.5
5.85	2.38	2.5
8.03	3.27	2.5
10.35	4.35	2.4
8.45	3.65	2.3
7.71	3.4	2.3
10.26	4.53	2.3
12.42	5.5	2.3
9.11	4.1	2.2
10.93	4.93	2.2
5.67	2.58	2.2
5.97	2.74	2.2
8.03	3.7	2.2
16.32	7.62	2.1
30.6	14.71	2.1
8.48	4.23	2.0

41.07	20.63	2.0
14.47	7.38	2.0
7.28	3.72	2.0
5.11	2.63	1.9
5.13	2.65	1.9
5.2	2.69	1.9
16.13	8.46	1.9
5.03	2.64	1.9
6.2	3.26	1.9
5.52	2.92	1.9
6.08	3.26	1.9
2292.3	1232.2	1.9

GRAND PIER
NUTRANL RESULTS
GREATER THAN 5 pCi/g
TOTAL RADIUM

Th-232	Ra-226	Ratio, Th-232/ Ra-226
6.53	3.55	1.8
7.54	4.13	1.8
33.73	18.49	1.8
5.52	3.04	1.8
5.98	3.3	1.8
216.84	119.93	1.8
15.92	8.84	1.8
6.62	3.69	1.8
5.68	3.2	1.8
4.99	2.86	1.7
15.33	9.12	1.7
17.43	10.42	1.7
86.23	51.57	1.7
6.89	4.13	1.7
5.65	3.39	1.7
8.31	5.24	1.6
15.56	9.91	1.6
4.99	3.36	1.5

4.99	3.38	1.5
4405.9	3001.4	1.5
16.72	11.54	1.4
5.83	4.06	1.4
11.41	8.41	1.4
5.26	4.17	1.3
22.51	17.95	1.3
1141.2	933.11	1.2
9.26	7.78	1.2
18.38	15.53	1.2
10.86	9.55	1.1
6.41	5.99	1.1
51.1	50.54	1.0
6.48	6.54	1.0
5.89	7.19	0.8
4.09	5.38	0.8
11.17	14.7	0.8

GRAND PIER
NUTRANL RESULTS
GREATER THAN 5 pCi/g
TOTAL RADIUM

Th-232	Ra-226	Ratio, Th-232/ Ra-226
54.5	75.16	0.7
5.87	8.34	0.7
3.72	5.37	0.7
3904.9	5773.8	0.7
6.85	10.17	0.7
790.06	1209	0.7
83.27	133.03	0.6
3.31	5.96	0.6
3.12	5.73	0.5
2.64	5.03	0.5
2.84	5.48	0.5
10.19	20.36	0.5
2.92	6.22	0.5
5746.5	12379	0.5
3.06	6.8	0.5

585.59	1343.2	0.4
9.4	22.27	0.4
5.57	13.22	0.4
7.51	17.94	0.4
16.39	39.81	0.4
1190.2	2893.8	0.4
1306.3	3313.3	0.4
3.56	9.27	0.4
16.88	48.2	0.4
2.22	6.39	0.3
2.17	6.28	0.3
2.06	9.07	0.2
1.04	5.38	0.2
3.21	16.95	0.2

GRAND PIER
NUTRANL RESULTS
GREATER THAN 5 pCi/g
TOTAL RADIUM

Th-232	Ra-226	Ratio, Th-232/ Ra-226
79.96	554.9	0.1
1.2	9.38	0.1
2.92	27.21	0.1
1.25	12.05	0.1
0.6	5.88	0.1
26.05	277.08	0.1
1.26	15.2	0.1
0.56	6.94	0.1
0.47	8.63	0.1

Reviewing the data shows that the Th-232 to Ra-226 varies from 0.1 to 21. Ratios less than 1.0 mean that Ra-226, not Th-232, dominates.

6. **Figure "North Area Boring Locations"**–This figure does not show boring site

B-19A although there is data tabulated in Appendix C.

7. **Appendix B, data sheets**–The notation on this sheet is that the probe was calibrated for steel, but the boring sleeve was PVC. The reason for not recalibrating to PVC was not explained in the text.

   This means that the measured count rates are higher than if steel sleeving was used. It is unclear if the calibration factor (5574 counts per 30 seconds) applies to steel or PVC. The text should explain this situation since it influences how the tabulated count rates are interpreted.

8. **Appendix C, data**–Anomalies in the gamma spectroscopy data need to be explained in the text.

   Sample ID: 012827 — U-238, Po-210, Po-216 are reported as having very high concentrations (1130 pCi/g, 69300 pCi/g, 42300 pCi/g, respectively) but these have such extremely low gamma ray emission frequencies that they have, effectively, no gamma emissions. They would be very difficult to find in any gamma analysis. Normally they are not found.

   Tl-210: 33 of 54 samples registered this radionuclide. It has a very low frequency of emission (less than 0.02% of the time) yet seems to be appearing very often. This is anomalous.

9. USEPA data showed a third site of potential contamination that does not seem to be registered in this data. Since it was represented by a single, but quite high, data point either the site is very small or the data was spurious. The text should make note of this.

10. The results of the expanded survey are summarized but not documented with grid maps or grid readings as in the main survey.